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A HOOK-ENDED STEEL WIRE NETTING

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A hook-ended steel wire netting

Field of the Invention

The present invention generally relates to steel wire nettings in steel furniture and, in particular, to the structure of the connection between steel wires and a frame.

Background technology

Steel furniture is appreciated because of its easy assembly, modern style, etc., particularly furniture which combines steel with fabrice, such as sofas, folding sofa beds, steel camp beds, etc. The steel wire netting on conventional steel furniture, eg. the net mattress of a camp bed, is made of a steel wire netting with a frame. The steel wires are connected to the frame using dot welding. However, this leads to the disadvantage that the steel wire netting can easily distend and deform, and it is difficult to maintain the tension in the netting.

In order to enable a camp bed to maintain tension in the netting, patent No CN 97238776 describes a composite steel wire camp bed in which the steel wires are tensed by a frame. The frame includes two cross rails and four longitudinal rails. Longitudinal rails are secured to each other by connection shafts and cross rails are secured to longitudinal rails by right connection braces at the four corners where longitudinal rails and cross rails intersect. Camp beds of this type can maintain tension in the wire netting, and flexible bearings can be installed underneath, which allows users to lie in comfort and prevents the surface of the bed from distending downwards. However, this structure includes too many components and the connection structure is complex. In addition, the production process is complex, which increases the cost. Therefore, it is difficult to use the above structure widely in sofas, sofa beds and the like.

Brief summary of the invention

The purpose of the present invention is to create a hook-ended steel wire netting which is firm, reliable, flexible, comfortable, and has a simple structure.

In order to realize these aims, the solution presented in this invention is: a netting of hook-ended steel wires, which may comprise:

A first cross rail having a row of first sockets on its outer portion in a line along the axial direction.

A second cross rail having a row of second sockets on its outer portion in a line along the axial direction.

One or more longitudinal steel wires, both ends of which are hooks. The first end hook of each steel wire encloses a part of the outer portion of the first cross rail, and is secured by being inserted into one of the first sockets. The second end hook of each steel wire encloses a part of the outer portion of the second cross rail, and is secured by being inserted into one of the second sockets.

A first longitudinal rail with both ends separately secured to the first end of the first cross rail and the first end of the second cross rail.

A second longitudinal rail with both ends separately secured to the second end of the first cross rail and the second end of the second cross rail.

Meanwhile, the first longitudinal rail and the second longitudinal rail tense the steel wires to form a steel wire netting.

The cross-sections of the described first and second cross rails are circular, square or of another suitable shape.

The described first sockets are disposed on the outer portion of the first cross rail; the described second sockets are disposed on the outer portion of the second cross rail.

The end hooks of the described longitudinal steel wires are formed by curving the end portions of steel wires through 180 degrees. The shape of the curved portion between the hook and the straight portion of the steel wire may match the shape of the outer portion of the cross rails.

The cross sections of the described first and second longitudinal rails circular, square or of another suitable shape.

The described first cross rail may be an L-shaped rail, of which the shorter portion is regarded as the first longitudinal rail. The described second cross rail may

be an L-shaped rail, of which the shorter portion is regarded as the second longitudinal rail. The two L-shaped rails are connected to form a frame.

The described first cross rail may be a U-shaped rail, of which the two parallel portions are regarded as the first longitudinal rail and the second longitudinal rail. The described second cross rail is a straight rail and is secured to the two ends of the U-shaped rail to form a frame.

A hook-ended steel wire netting may comprise:-

A first cross rail having a row of first sockets on its outer portion in a line along the axial direction.

A second cross rail having a row of second sockets on its outer portion in a line along the axial direction.

One or more longitudinal steel wires, both ends of which are hooks. The first end hook of each steel wire encloses a part of the outer portion of the first cross rail, and is secured by being inserted into one of the first sockets. The second end hook of each steel wire encloses a part of the outer portion of the second cross rail, and is secured by being inserted into one of the second sockets.

A first longitudinal rail having a row of third sockets on its outer portion in a line along the axial direction.

A second longitudinal rail having a row of fourth sockets on its outer portion in a line along the axial direction.

One or more cross steel wires, both ends of which are hooks. The first end hook of each steel wire encloses a part of the outer portion of the first longitudinal rail, and is secured by being inserted into one of the third sockets. The second end hook of each steel wire encloses a part of the outer portion of the second longitudinal rail, and is secured by being inserted into one of the fourth sockets.

The two ends of the first longitudinal rail are separately secured to the first end of the first cross rail and first end of the second cross rail. The two ends of the second longitudinal rail are separately secured to the second end of the first cross rail and second end of the second cross rail. Meanwhile, the first longitudinal rail

and the second longitudinal rail tense the steel wires to form a steel wire netting.

The described cross and longitudinal steel wires are connected or partly connected to each other at the points where they intersect to form a net.

To form the above structure, the end hooks of one or more longitudinal steel wires are first inserted into sockets of two cross rails, then longitudinal rails are used to tense the steel wires; the longitudinal rails are securely connected to the cross rails to form a frame. In order to increase the strength of the netting and to reduce the length of the cross steel wires, one or more longitudinal rails may be added into the frame; then the end hooks of one or more cross steel wires are inserted into opposing sockets of two longitudinal rails, and the cross and longitudinal steel wires are securely connected to each other at the points where they intersect to form a net.

In the present structure, the steel wires and the cross and longitudinal rails are connected with bayonet connections, not by welding. Compared to existing technology, the present invention requires fewer compoments, its connections have a simpler structure, the netting is more durable and can be constructed using less welding. In addition, the netting has a high elasticity, which increases the comfort of the user. This netting may be used to manufacture camp beds, sofa seats and backs, etc.

Brief description of the drawings

The present invention will be described with greater specificity and detail through the use of the accompanying drawings, in which:-

Figure 1 is a front view of a first embodiment of the present invention.

Figure 2 is a explicatory drawing of the embodiment shown in Figure 1, illustrating the connection of the longitudinal steel wires to the cross rails.

Figure 3 is a explicatory drawing of the embodiment shown in Figure 1, illustrating the connection of the cross steel wires to the longitudinal rails.

Figure 4 is a front view of a second embodiment of the present invention.

Figure 5 is a cross-sectional view of the embodiment shown in Figure 4, viewed

from the line A-A.

Figure 6 is a front view of a third embodiment of the present invention.

Figure 7 is a front view of a fourth embodiment of the present invention.

Figure 8 is a front view of a fifth embodiment of the present invention.

Detailed description of the preferred embodiments

With reference to the embodiment of a hook-ended steel wire netting shown in Figure 1, a hook-ended steel wire netting includes: two cross rails 1; two longitudinal rails 2; one or more cross steel wires 3 with end hooks 31; one or more longitudinal steel wires 4 with end hooks 41. Two rows of sockets are disposed on cross rails 1 and longitudinal rails 2. Both ends of one or more longitudinal steel wires enclose the outer portion of the cross rails, and the end hooks are inserted into opposing sockets. Two longitudinal 2 rails tense the longitudinal steel wires 4 and are secured to the ends of the cross rails 1. One or more cross steel wires 3, with hook ends 31 inserted into opposing sockets 21 of the longitudinal rails 2 are disposed underneath the longitudinal steel wires 4. The cross steel wires 3 and longitudinal steel wires 4 are dot welded at the points where they intersect to form a steel wire netting, with the longitudinal rails 2 and cross rails 1 forming a frame. To further increase the strength of the netting and to reduce the length of the steel wires, one or more longitudinal rails 2 connected to the cross rails 1 may be added.

With reference to Figure 2, the cross rails 1 both have circular cross-sections, which can increase tensile strength of the cross rails 1 in use. The end hooks 41 on the longitudinal steel wires 4 are formed by curving the end portions of the steel wires through 180 degreees, and the curved portion between the hook 41 and the straight portion of each wire encloses some of the outer portion of the cross-rails 1.

With reference to Figure 3, the longitudinal rails 2 both have circular cross-sections, which can increase the tensile strength of the longitudinal rails 2 in use. The end hooks 31 on the cross steel wires 3 are formed by curving the end portions of the steel wires through 180 degreees, and the curved portion between the hook 31 and the straight portion of each wire encloses some of the outer portion of the cross-rails

1.

In the above structure, both end hooks of one or more longitudinal steel wires 4 are first inserted into opposing sockets 11 of the two cross rails, then longitudinal rails 2 are used to tense the steel wires 4 and the longitudinal rails 2 are securely connected to the cross rails 1 to form a frame. Then both end hooks of one or more cross steel wires 3 are inserted into opposing sockets 21 of the two longitudinal rails 2. The cross and longitudinal steel wires are securely connected to each other at the points where they intersect to form a supportive netting for the suface of the bed. In the present structure, the steel wires and the cross and longitudinal rails are connected with bayonet connections, not by welding. Compared to existing technology, the present invention requires fewer compoments, its connections have a simpler structure, the netting is more durable and can be constructed using less welding. In addition, the netting has a high elasticity, which increases the comfort of the user.

With reference to the second embodiment shown in Figure 4, a hook-ended steel wire netting may include two L-shaped rails 1,2 and one or more cross and longitudinal steel wires 3,4 which hooks 31,41 at both ends. The shorter portions of the L-shaped rails can be regarded as longitudinal rails. Sockets 11,21 are disposed on the L-shaped rails. Both end hooks of one or more longitudinal steel wires are separately inserted into opposing sockets 11 on the L-shaped rails. The longitudinal rails tense the steel wires, and the two L-shaped rails are connected to form a frame. One or more cross steel wires, with both hook ends inserted into opposing sockets 21 of the longitudinal rails 2 are disposed underneath the longitudinal steel wires 4. The cross 3 and longitudinal 4 steel wires are dot welded at the places where they intersect to form a steel wire netting surface, with the L-shaped rails forming a frame. To further increase the strength of the netting and to reduce the length of the steel wires, one or more longitudinal rails 2 connected to the cross rails 1 may be added.

As shown in Figure 5, the two cross rails both have square cross-sections, which can increase the tensile strength of the cross rails when in use. The end hooks 41 of the longitudinal steel wires 4 are formed by curving the end portions of the steel wires through 180 degrees, and shape of the curved portion between the hooks 41 and the

straight portion of the wire matches the shape of the outer portion of the cross rails 1.

With reference to the third embodiment shown in Figure 6, a hook-ended steel wire netting may include one L-shaped rail 1, the shorter portion of which is regarded as a longitudinal rail 2, one or more cross steel wires 3, one or more longitudinal steel wires 4, a long straight rail and a short straight rail. The long straight rail is regarded as a cross rail 1', and the short straight rail is regarded as a longitudinal rail 2'. Sockets are disposed on the cross rails 1,1' and longitudinal rails 2,2'. Both end hooks if one or more longitudinal steel wires 4 are separately inserted into opposing sockets on cross rails 1 and 1', and the longitudinal rails 2,2' are used to tense the steel wires. The cross rails 1,1' and 2,2' are connected at the ends to form a frame. One or more cross steel wires 3, with end hooks 31 inserted into opposing sockets 21 on the longitudinal rails 2,2' are disposed underneath the longitudinal steel wires 4. The cross 3 and longitudinal 4 steel wires are dot welded at the places where they intersect to form a steel wire netting.

With reference to the fourth embodiment shown in Figure 7, a hook-ended steel wire netting may include one U-shaped rail, a straight cross rail 1', one or more cross steel wires 3 with end hooks 31 one or more longitudinal steel wires 4 with end hooks 41. The two parallel portions of the U-shaped rail are regarded as the two longitudinal rails 2, and the middle portion of the U-shaped rail is regarded as the cross rail 1. Sockets are disposed on the cross rails 1, 1' and the longitudinal rails 2. Both end hooks if one or more longitudinal steel wires 4 are separately inserted into opposing sockets on cross rails 1 and 1', and the longitudinal rails 2 are used to tense the steel wires 4. The cross rail 1' is connected to the two ends of the U-shaped rail to form a frame. One or more cross steel wires 3, with end hooks 31 inserted into opposing sockets 21 on the longitudinal rails 2 are disposed underneath the longitudinal steel wires 4. The cross 3 and longitudinal 4 steel wires are dot welded at the places where they intersect to form a steel wire netting. To further increase the strength of the netting and to reduce the length of the steel wires, one or more longitudinal rails 2 connected to the cross rails 1,1' may be added.

With reference to the fifth embodiment shown in Figure 8, a hook-ended steel

wire netting may include two cross rails 1, two longitudinal rails 2, and one or more longitudinal steel wires 4 with end hooks 41. Sockets are disposed on the cross rails 1 on the outer portions in a line along the axial direction. Both end hooks of one or more longitudinal steel wires 4 are inserted into opposing sockets on the two cross rails 1. The two longitudinal rails 2 tense the steel wires 4 and are securely connected to the cross rails 1 to form a frame.

A hook-ended steel wire netting is provided in the present invention, in which the cross and longitudinal steel wires are connected to the longitudinal and cross rails by end hooks. The netting has a simple structure which is safe, durable and highly practical for industry.